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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/053,712	01/24/2002	Tsunenori Yamauchi	020076	4240

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EXAMINER	
LATTIN, CHRISTOPHER W	
ART UNIT	PAPER NUMBER
2812	

DATE MAILED: 10/28/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/053,712	YAMAUCHI, TSUNENORI	
	Examiner	Art Unit	
	Christopher W Lattin	2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 September 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *5,6 and 16-20* is/are allowed.

6)☒ Claim(s) *1-4 and 7-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2 and 7-15 are rejected under 35 U.S.C. 102(e) as being anticipated by Sakamoto (U.S. Patent 6,387,768).

With reference to independent claim 1, Sakamoto teaches a semiconductor device comprising a first semiconductor layer 210 formed on a semiconductor substrate 110; an outgoing base electrode 1810 formed on the first semiconductor layer 210; a base layer 1910 formed on the first semiconductor layer 210, directly connected to the outgoing base electrode 1810 at a side surface of the outgoing base electrode, and formed of silicon germanium containing carbon; and a second semiconductor layer 2320 formed on the base layer. See especially column 2 line 32- column 3 line 67.

With reference to dependant claims 7, 9 and 11, Sakamoto teaches the semiconductor device according to claim 1, wherein side-etching of an insulation film immediately below the outgoing base electrode is below 0.1 um, wherein the base layer is projected upward beyond the upper surface of the outgoing base electrode by above

0.02 um and wherein the first semiconductor layer 210 is a collector layer; and the second semiconductor layer 2320 is an emitter layer.

With reference to independent claim 2, Sakamoto teaches a semiconductor device comprising a first semiconductor layer 210 formed on a semiconductor substrate 110; an outgoing base electrode 1810 formed on the first semiconductor layer210; a base layer 1910 formed on the first semiconductor layer, directly connected to the outgoing base electrode 1810, and formed of silicon germanium containing carbon; and a second semiconductor layer 2320 formed on the base layer, the outgoing base electrode and the base layer are formed continuous to each other.

With reference to dependant claims 8, 10 and 12, Sakamoto teaches the semiconductor device according to claim 2, wherein side-etching of an insulation film immediately below the outgoing base electrode is below 0.1 um, wherein the base layer is projected upward beyond the upper surface of the outgoing base electrode by above 0.02 um and wherein the first semiconductor layer 210 is a collector layer; and the second semiconductor layer 2320 is an emitter layer.

With reference to claims 13,and 14, Sakamoto teaches a method for fabricating a semiconductor device comprising the steps of: forming an outgoing base electrode 1810 with an opening formed on a first semiconductor layer 210 formed on a semiconductor substrate; and forming a base layer 1910 of silicon germanium containing carbon at

least in the opening; and forming a second semiconductor layer 2320 on the base layer, wherein the step of forming the base layer includes the step of forming a carbon-content silicon germanium layer in the opening and on the outgoing base electrode; the step of burying a mask material in the opening with the carbon-content silicon germanium layer; and the step of etching the carbon-content silicon germanium layer with the mask material as a mask.

With reference to claim 15, Sakamoto teaches a method for fabricating a semiconductor device, comprising the steps of: forming a base layer of silicon germanium containing carbon and an outgoing base electrode connected to the base layer on a first semiconductor layer formed on a semiconductor substrate, the base layer and the outgoing base electrode being formed continuous to each other; and forming a second semiconductor layer on the base layer.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakamoto (U.S. Patent 6,387,768) in view of Saito et al. (U.S. Patent 6,537,369).

Sakamoto is applied to claims 1 and 2 supra, but fails to teach the exact amount of carbon in the base layer. Saito et al. teach a semiconductor device layer of SiGe containing carbon, wherein the layer contains carbon by 0.01% to 60. It would have been obvious to one skilled in the art at the time of the invention to use the percentages of carbon as taught by Saitoh et al. in order to increase the speed while maintaining flexibility in lattice matching of the device taught by Sakamoto. See especially column 1 and Figure 5 of Saitoh et al.

Allowable Subject Matter

Claims 5, 6, and 16-20 are allowed for reasons previously made of record.

Response to Arguments

Applicant's arguments filed 9/16/2003 have been fully considered but they are not persuasive. Applicant argues that the base layer 1910 fails to directly contact the base electrode 910. However, layer 910 and 1810 are comprised of the same materials and perform the same function. Therefore both layers 910 and 1810 are outgoing base electrodes and meet the requirements of the claimed device.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Lattin whose telephone number is (703)

305-3017. The examiner can normally be reached Monday through Friday from 8:00 A.M. to 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling, can be reached at (703) 308-3325. The fax numbers for this Group are (703) 872-9318 for responses to non-final actions and (703) 872-9319 responses to final actions.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

CWL
October 10, 2003